

said second expansive surface thereby exhibiting a second surface texture which is more abrasive than said first surface texture, said binder composition being selected from the group consisting of a scatter-applied binder composition and a pattern-applied binder composition,

whereby the differing surface textures of said opposite expansive surface provide bi-functional characteristics for said wipe.

REMARKS

Responsive to the Official Action mailed November 11, 2002, applicant has further revised the claims of his application in an earnest effort to place this case in condition for allowance. Specifically, claims 6 and 7 have been canceled, and claim 1 further amended. Reconsideration is respectfully requested.

In the Action, the Examiner rejected the pending claims under 35 U.S.C. §112, referring to the language in claim 1 specifying a binder composition which enhances a surface abrasiveness.

It is respectfully maintained that those skilled in the art, to which the present disclosure is directed, are quite familiar with the various types of binder compositions which can be employed for nonwoven fabric manufacture, and that a binder composition suitable for the present application is readily commercially available. By way of example, applicant submits herewith the Preliminary Data Sheet for Clariant Perstorp, a binder composition which is particularly suited for use with nonwoven materials. As noted in the Data Sheet, this composition forms a "stiff and clear film", achieving a film hardness as specified in the technical data set forth in the Data Sheet.

As further noted in the document, when the composition is applied as a binder for nonwoven materials, it can be particularly suitable for products when "a stiff grip is required".

Thus, it is respectfully maintained that those skilled in the art are familiar with the types of binder compositions which are suitable for use in practicing the present invention, whereby a scatter-application or pattern-application of the composition to one surface of a nonwoven fabric construct, in accordance with the present invention, provides the desired bi-functionality of the construct. Accordingly, it is believed that the rejections under 35 U.S.C. §112 can be withdrawn.

In the Action, the Examiner has questioned how the recited binder composition enhances surface abrasiveness. In essence, the binder composition itself, by virtue of its stiff characteristics, provides individualized regions at which the binder composition is applied, which regions exhibit the binder stiffness, and thus enhances the abrasiveness of the associated surface. Droplets or other quantities of the binder composition (as may be applied by scatter-application or pattern-application) dry and cure to form particle-like abrasive elements, which are self-adhered to the associated substrate by virtue of the adhesive nature of the binder composition. While the binder composition acts to stiffen fibers to which it is applied, it is the composition itself which provides the inherent stiffness, when cured, to enhance surface abrasiveness.

It is further noted that the extensive test data set forth in the present application further discloses variations in practice of the present invention for optimizing the desired results. As discussed at page 9, line 26 *et seq.*, the frictional characteristics of

a fabric depend on the surface roughness, area of contact, and elastic-plastic deformation of the material. Simplified, the frictional force is a summation of adhesive force and deformation force of the total structure. As noted, a higher coefficient of friction of Samples B and D is an indication of higher deformation force being involved, that is, shearing of internal junctions, besides just the adhesive force, which is the shearing of surface junctions.

Sample E was developed to exhibit a firm, rough open fibrous structure on the surface, and in the core. The rough side of this sample exhibited a coefficient of friction which was not significantly different than that exhibited by Samples B and D.

The Control Sample, which did not have a binder composition applied to it in accordance with the present invention, was found to exhibit a significantly lower coefficient of friction than the rough sides of Samples B, C, D, and E, with the frictional behavior of this type of fabric believed to be clearly dominated by the shearing of surface junctions.

In the Action, the Examiner rejected the claims under 35 U.S.C. §102 or §103, over U.S. Patent No. 4,082,886, to Butterworth et al. However, this reference does *not* contemplate the formation of a bi-functional wipe having differing *abrasiveness* characteristics, as specifically set forth in the pending claims. Accordingly, the Examiner's rejections are respectfully traversed.

At column 2, lines 28 *et seq.*, the nature of the material disclosed in Butterworth et al. is discussed. The described nonwoven fabric is stated as including both natural wood pulp fibers and synthetic wood pulp fibers, with differing proportions in three

different regions of the fabric. This patent goes on to state that to produce a high level of liquid absorption, a facing region at one external boundary surface of the material is selected so as to not exhibit too much water repellance. It is further stated that the facing region "must have an external boundary surface that also exhibits good softness and *abrasion resistance*" (column 2, lines 45-47).

The patent goes on to describe how different characteristics are required for the central region of the material, as well as for the region adjacent the other external boundary surface of the material, "in order to give the product of this invention a high level of liquid retention" (column 2, line 53). Again, it is important to note that there are *no teachings* in this reference of achieving *differing abrasiveness characteristics*, with the principal thrust of this patent being directed to *liquid retention*.

In the Action, the Examiner has made reference to the disclosure in this reference of application of a binder. In this regard, it is respectfully maintained that there is no suggestion in this reference of scatter-application or pattern-application of a binder composition to enhance abrasiveness. Rather, this patent contemplates that application of a binder composition is intended to increase abrasion resistance. Use of binders in this fashion is well-known, with *uniform coating* of a binder composition tending to substantially coat the fibers at the surface to which it is applied. There is no teaching in this reference of either scatter-application or pattern-application of the binder composition, as claimed, to thus enhance surface abrasiveness. In fact, it is not at all clear from this teaching in the Butterworth et al. reference that the abrasiveness of

this surface will be any different than the abrasiveness of the opposite surface of the nonwoven fabric, as further specified by the pending claims.

In the Action, the Examiner has further rejected the pending claims under 35 U.S.C. §103. Paragraph 9 of the Action is believed to be based upon U.S. Patent No. 6,022,818, to Welchel et al., in view of U.S. Patent No. 5,213,588, to Wong et al.

The Welchel et al. reference specifically contemplates a composite structure that has an absorbent-rich side and a matrix-rich side. The structure is stated as being well-suited for handling fluids, i.e., body fluids absorbed from personal care products. There are *no teachings* in this reference of configuring the disclosed composite to exhibit differing *abrasiveness* on the two opposite surfaces.

The Examiner acknowledges the shortcomings in the teachings of the Welchel et al. reference, noting that this reference does not teach application of an abrasive coating. In this regard, the Examiner relies upon Wong et al., to overcome these deficiencies in the teachings of Welchel. However, as noted in applicant's previous response, Wong et al. specifically contemplates securement of *abrasive particles* by means of an adhesive. Clearly, this patent does not teach or suggest scatter-application or pattern-application of a binder composition which in and of itself is sufficiently hard, when cured, as to enhance surface abrasiveness.

At column 5, lines 64 *et seq.*, Wong et al. states:

The abrasive wiping articles herein are formed by printing onto the base nonwoven substrate as hereinbefore described, and then subsequently curing, a liquid, e.g., aqueous, dispersion containing *solid polymeric abrasive particles*. Such particles, *when affixed to the base nonwoven substrate by means of the cured adhesive*

components of the scrubbing bead mixture impart desirable enhanced soil removal performance characteristics to the wiping articles of the present invention.

Thus, applicants must respectfully disagree with the reliance upon Wong et al. to overcome the deficiencies in the teachings of Welchel et al. Only applicant's own disclosure contemplates scatter-application or pattern-application of a binder composition, to one surface of a hydroentangled substrate, to thereby enhance surface abrasiveness for wiping applications. Wong et al. does not teach or suggest such a modification of Welchel et al.

In the Action, the Examiner has further relied upon U.S. Patent No. 4,753,839, to Greenway, in combination with the Wong et al. reference, in rejecting the pending claims under 35 U.S.C. §103.

Greenway contemplates a stretchable fabric comprising a blend of cellulosic and thermoplastic fibers. The Examiner acknowledges that Greenway does not disclose specific two-layer embodiments in the invention. It is respectfully maintained that Greenway's teachings of employing various combinations of blends and fibers does not teach or suggest the present invention.

At column 3, line 50 *et seq.* of Greenway, it is stated:

Although one layer of blended fibers is preferred, multiple layers of various combinations of blends of fibers may be used to give variations in the fabric. In addition, the layer or layers of fabric may be 100% thermoplastic depending on the requirements of the fabric.

It is respectfully maintained that it is reading beyond the limited teachings of this patent to suggest that this passage in Greenway suggests the present invention as

claimed, wherein scatter-application or pattern-application of a binder composition selectively enhances the abrasiveness of one surface. The "variations" to which Greenway alludes could relate to absorptive characteristics, drapeability characteristics, strength characteristics, or other physical characteristics of nonwoven fabrics.

The Wong et al. reference was discussed above, but again, it is respectfully maintained that the teachings of Wong et al. do not overcome the teachings of Greenway in teaching or suggesting the present invention as claimed. Again, Wong et al. is limited in its teachings to the use of *abrasive particles*, and simply does not teach or suggest enhancing surface abrasiveness by application of a binder composition itself.

In the Action, the Examiner has further relied upon U.S. Patent No. 4,810,568, to Buyofsky et al. However, it is respectfully maintained that this reference does not overcome the deficiencies in the teachings of Greenway and Wong et al.

Buyofsky et al. contemplates a nonwoven fabric structure having a binder applied to the "jet surface" thereof. This language in the patent is intended to refer to that surface of the fabric against which high speed jets of fluid are directed for effecting entanglement. At column 3, lines 64 *et seq.*, it is stated that:

The adhesive binder employed can be any of the aqueous latex binders that are conventionally employed as binders for nonwoven fabrics.

The patent goes on to state that:

The binder is employed in an effective amount, that is, that amount which will result in a fibrous layer having sufficient *abrasion resistance* for the intended end-use application.

Thus, it is clear that this reference also fails to teach or suggest selective application of a binder composition for *enhancing abrasiveness*. Again, those skilled in the art are quite familiar with the various types of binder compositions, and would recognize this patent as contemplating use of a binder which would function so as to adhere together the fibers to which it is applied, thus enhancing *resistance* to abrasion. This, of course, is distinctly different than *enhancing abrasiveness*, in accordance with the present invention, wherein a relatively hard, polymeric binder composition is selected, such as disclosed in the enclosed Data Sheet, to give an abrasive surface quality to one surface of the claimed nonwoven fabric construct.

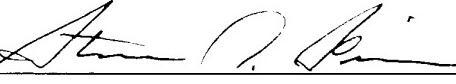
In the Action, the Examiner has stated that the prior art teaches that the "abrasive particles are part of the binder composition". Applicants must respectfully disagree. As noted from the above-referenced passage of Wong et al., the abrasive particles are described as being adhered "by means of the cured adhesive components", thus plainly disclosing a "two-phase" composition, including particulate material, and a liquid carrier.

This is clearly in distinction from applicant's disclosed construct, where use of "relatively hard", "polymeric" binder compositions is specifically discussed. Clearly, those skilled in the art would recognize that applicant's claims are directed to a construct wherein the liquid binder itself, and not any suspended particles, provide the desired abrasiveness for the selected fabric surface.

In view of the foregoing, formal allowance of claims 1-4, 8-13, and 15 is believed to be in order and is respectfully solicited. Should the Examiner wish to speak with applicant's attorneys, they may be reached at the number indicated below.

The Commissioner is hereby authorized to charge any additional fee which may be required in connection with this submission to Deposit Account No. 23-0785.

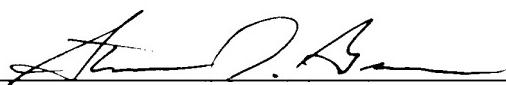
Respectfully submitted,

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CERTIFICATE OF MAILING

I hereby certify that this paper is being deposited with the United States Postal Service with sufficient postage at First Class Mail in an envelope addressed to: Commissioner for Patents, Washington, D.C. 20231 on **February 11, 2003**.




Perstorp Clariant
Preliminary Data Sheet
® Appretan TH 210 S ca 46 %
Applications

Appretan TH 210 S is used for finishing of nonwoven materials, fibreglass, textile materials and wood.

Finishing with Appretan TH 210 S gives stiff materials with high dry- and wet tensile strengths. The dispersion can also be mixed with other similar dispersions to increase their dry tensile strengths.

General information

Appretan TH 210 S is a reactive homopolymer emulsion of vinylacetate, stabilised with surfactants.

Properties

Appretan TH 210 S is a reactive homopolymer emulsion. It is a dispersion with small particle size distribution and low viscosity.

Appretan TH 210 S has high adhesion towards both natural- and synthetic fibres.

Above MFT the dispersion forms a stiff and clear film.

The polymer contains reactive groups and may be crosslinked at temperatures of 130-150 °C.

Specifications
Solids content

(DIN 53 188 / ISO 1028)

Viscosity

(Brookfield RVT 1/20 @ 23 °C (ISO 2855))

pH

(DIN 53 705 / ISO 1145)

Other technical data

| | | |
|------------------------------|---------|--------|
| Particle size | ca 0.2 | µm |
| Film formation temperature | ca 16 | °C |
| Glass transition temperature | ca 28 | °C |
| Film hardness | ca 160 | Kg |
| Density | ca 1.08 | /cm³ |
| Storage stability | ca 6 | months |

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Enskilda Handelsbanken



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Applications

Appretan TH 210 S is used as binder for finishing of nonwoven materials, fibreglass, textile materials and wood in different application areas.

The dispersion is particularly suitable for products when a stiff grip is required.

After crosslinking of Appretan TH 210 S the material will have good dry- and wet tensile strength.

Storage

To ensure safe storage of Appretan TH 210 S containers should be well sealed to prevent evaporation of water and formation of skin on the surface. The emulsion must be stored at temperatures above freezing. A temperature of 5-25 °C for not more than six months is recommended.

Occupational safety

Appretan TH 210 S is water-based and non-toxic in normal use. Nevertheless general safety precautions in the processing of polymer dispersions should be observed. Protective gloves and goggles should be worn and working areas should be adequately ventilated.

Package

The emulsion is delivered in 100 kg fibre drums, 1000 kg containers or in bulk.